3000 Operations

Table of Contents

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3000 Operations

Refer to Section 3000 of the Region 9 Contingency Plan

3100 Operations Section Organization

Refer to Section 3002 of the Region 9 Contingency Plan

The Operations Section of the ICS is responsible for all operations directly applicable to the primary mission. The section directs the preparation of unit operational plans, requests and or releases resources, makes expedient changes to the Incident Action Plan as necessary, and reports such to the Incident Commander (IC/UC).

In the RCP, this section also lists the various operations branches.

Refer also to Chapter 7 of the Incident Management Handbook (IMH).

3110 Organization Options

Refer to Section 3002.01 of the Region 9 Contingency Plan

3200 Recovery and Protection

Oil spilled in open water is a threat to sensitive natural resources. Often, rough wind and sea conditions will be contributing factors to the cause of the spill and these same conditions will preclude response and deployment of surface equipment or minimize their effectiveness. Such conditions may cause the oil to be dispersed in the water column, evaporated into the atmosphere, and/or transported away from sensitive areas and resources. These conditions may prescribe a decreased response with an action plan that allows a natural "weathering and cleansing" process. If possible, however, an active response must be undertaken in order to remove oil from the environment and thereby reduce the threat to sensitive natural resources.

Usually a series of successive strategies are necessary and appropriate for any spill. Certain environmental and situational specific conditions limit the array of possible useful strategies. Omission of a single appropriate strategy can have severe results; therefore it is very important that every effort be given to implementation of the strategies described.

Mechanical control and recovery countermeasures are most effective immediately after a spill when the oil is in a thick layer, and covers a small area. When oil is spilled in or allowed to escape to open water, the possibility of containment and recovery is dependant upon the weather and sea conditions. Booms and skimmers are most effective in calm waters but can work during moderate weather and sea conditions. When the open water is rough, booms and skimmers are ineffective and containment becomes impossible. Rough sea conditions speed the rate of spreading resulting in diminishing opportunity for open water recovery.

In bays like San Francisco and Humboldt, tidal mixing and tidal influence is so strong that a spill will rapidly spread throughout the affected bay. This rapid spread reduces on-water collection effectiveness. Also, as oil spreads it threatens and impacts an increasingly wider number of resources and sensitive sites. Therefore, quick response to contain and or confine the oil before it spreading occurs is vital to the effectiveness of the response and recovery.

The Recovery and Protection Branch Director is responsible for overseeing and implementing the protection, containment and cleanup activities established in the Incident Action Plan. The Recovery and Protection Branch Director reports to the Operations Section Chief.

Refer to the Incident Management Hand Book (IMH) for position responsibilities.

3200.1 Nonfloating Oils Recovery and Protection

Spills of nonfloating oils are expected to have less impact on shoreline habitats because smaller amounts of oil are likely to be stranded along the shoreline and cleanup activities are likely to be less disruptive. Any oil that is stranded, however, is likely to be very persistent because of the slow natural removal rates for heavy, adhesive oils.

Impacts on water-surface resources are also expected to be lower from spills of nonfloating oils because of the significant reduction in the amount of oil on the water surface. If the oil re-floats, it could be a chronic source of exposure to both water-surface and shoreline resources, but the risk is likely to be limited to areas adjacent to sunken oil deposits.

Oils that quickly sink or are suspended in the water column have greater impacts on organisms in the water column because more of the water-soluble fraction of the oil dissolves rather than evaporates. Oil on the surface is primarily weathered by evaporation to the atmosphere and, to a lesser degree, to the water column by dissolution. Oils suspended in the water column or deposited on the bottom are less likely to evaporate but more likely to dissolve, although the water-soluble fraction of heavy oils is usually very low. Consequently, the water column can have higher concentrations of toxic fractions from nonfloating oils than from floating oils.

Nonfloating oils are often high in polynuclear aromatic hydrocarbons (PAHs), which are the primary source of both acute and chronic toxicity to aquatic organisms.

For additional information on the behavior and environment risks of nonfloating oils please refer to the National Academy of Sciences (NAS) “Spills of Nonfloating Oils: Risk and Response” contained in Appendix XXVIII of the Region 9 Contingency Plan. For SF Bay, bottom drifter studies by the USGS have shown that the movement of water at the bottom of the bay tends to be inland and as far as the Carquinez Straight and the South Bay.

3210 Response Prioritization

Initial response is focused minimizing impacts though the strategic objectives of *Stopping the Source, Containment and Recovery,* and *Protection of Sensitive Areas* objectives (see Section 3200). In a spill event, Sensitive Area Protection prioritization should be determined by three considerations: which sites are at risk (how soon the oil will get to each sensitive site); the predefined hierarchy of protection priorities (Section 3211.2 below); and the time and response resources available to implement protection. Responders should not assume that sensitive locales equidistant from the source of a spill are at equal risk from the oil. For the purpose of prioritization, "risk" is defined as "the probability of spilled oil reaching the vicinity of a sensitive site of concern." This means that the urgency to protect a key resource is first determined by the likelihood that it will be impacted in the near future and the mobilization time for requisite response staff and equipment (can the sites at risk be protected by available resources before oil arrives?) If the sites are too numerous to protect with the response resources available within the projected times of impact, then triage of protection follows a prescribe order.

During an actual oil spill event, the relative likelihood of a site coming into contact with the oil is a function of the proximity of the spill to the site and whether prevailing conditions (the wind, current, and tides) at the time of the spill, will move the oil toward or away from it. At a minimum, first responders to a spill in the marine environment should obtain an initial forecast of oil movement speed and direction from a reliable source such as NOAA SSC or OSPR or forecast it based on present and impingent tides, currents, winds, and rainfall runoff conditions. This requires responders to use best information (optimally, real time information) about the local weather, tides, and currents to make the best prediction possible about the movement of the oil away from the spill release location. This information can be used to model the probable trajectory. Models can be as simple as estimates of movement on a chart / map or a computer simulation.

3210.1 Forecasting Oil Trajectories

Oil trajectories may be effectively forecast by several means and should always be done by skilled staff and usually trajectories are created and assessed by the Environmental Unit (see Section 4600). Each method can be limited by conditions or unforeseen patterns, and no method is guaranteed to accurately predict the future distribution of the oil. Because success or failure of response to nearshore spills is usually determined by actions in the early timeframes, UC and on-scene responders must take immediate action using simple predictive methods rather than delaying action until perfect information becomes available. Spill responders must act on the best information available at the moment. If time and resource permit, as many means as possible should be engaged to maximize the probability of accurately identifying slick movement and likely impacts, but this should never slow response. Regardless of the trajectory method used, it should always be recognized that such projections are helpful guidance but do not substitute for using on-scene information about currents and winds which determine slick movements.

If Environmental Unit or other skilled trajectory analysis is not available, initial response may need to proceed based on simple mathematical calculations of oil movement commonly called “back-of-the-envelope” or “envelope” trajectories. “Envelope” trajectories provide a quick yet fairly accurate estimate of the trajectory using best available information (which may not be accurate enough for more sophisticated modeling). It can quickly be recalculated using improved information. (After initial response, trajectories will be developed by Planning / Environmental as part of the IAP.)

Envelope trajectories are simple pencil and paper computations based on currents, tides and winds. Although an envelop trajectory is only gross approximation which does not take into consideration spreading or local turbulence, it will often be used as the first estimate of oil trajectory until better information is available from computer modeling or aerial perspective. This method is quick as well as effective and is not restricted by visibility. It has wide effectiveness and provides gross projections. The method is based on the premise that oil moves at 100% of current velocity and 3% of wind velocity. In areas with strong tidal currents the location of the leading edge of the oil slick can be quite accurately predicted using current estimates or information available in many tide books. If real time measurements of currents and winds are available from internet sources such as PORTS, or CODAR websites (such as SoCOOS or CenCoos) , then such real time wind and current information can be used significantly improve the predicted oil distribution, However in bays and estuaries time is critical and an initial trajectory estimate should not be delayed to perfect winds and currents. There are several methods of estimating trajectories; following is one method used to execute envelope trajectory calculations:

- Determine as nearly as possible the time and location of release.
- Get best available prevailing tides and currents at the location from tide & current tables. (In bays and rivers, data may be affected by high runoff of rainy seasons.)
- Calculate the movement of oil. Movement of oil = max current velocity X time from spill to next slack water. Using **max current provides** a projection of **least regret** since it will maximize the oil trajectory.
- Using a nautical chart or similarly geographically accurate map, draw a vector on the map from the point of origin for the distance that the current moves for the elapsed time. This may be subdivided by hours to estimate the hourly incremental advance of the trajectory.
- Winds influence oil movement slightly: wind movement = 0.03 X wind velocity. So, in open ocean and at slack tides in estuaries, wind adjustments become important (although some along coast currents can reach 2 knots.) From the end point of an interval of interest, draw a vector expressing the computed value in the direction of the wind.
- The resulting location is an approximation of the leading edge of the slick.
- Sites of concern which are proximal (in or near) the projected slick should be added to the list of sites to be protected. This method can be used to forecast the time by which a site is likely to be threatened and draft a timetable for protection of sites at risk. (See section 9800 for pre-identified sites and strategies which may be at risk.)
- When the tide phase shifts, this process is best started again from the point of origin, based on the presumption that oil is still releasing or escaping containment at that location, but remember that there is now an elongate smear of oil from the slick's initial path which must also be accounted for.

Once a trajectory has been developed, the threat to significant resources must be assessed. The trajectory should be used to determine the probable sequence of impacts to shorelines and probable times of impacts. <u>These calculations can be computed even if the person is not on-site and information can be transmitted by email, fax or phone to the command post</u>. This would best be done by a local OSPR scientific field staff (who have tools in the SISRS database to assist them) since they are most familiar with local resources at risk including seasonal variability. Another good analyst would be the SSC. If neither is available, responders should refer to the catalog of resources at risk which is section 9800 of this document. Whoever is entrusted with developing the trajectory and recommended deployments should, if possible, provide **written recommendations (or fax or email) to the UC/Ops chief as soon as possible**.

3210.2 Established Hierarchy of Protection Priorities

In general, State and Federal laws establish three priority levels for dedication of emergency oil spill response resources.

First Priority - Protection of human health and safety
Second Priority - Protection of environmental resources
Third Priority - Protection of economic resources

Examples of resources that will receive a first priority response
(human health and safety) include:

-drinking water intakes -other health/safety intakes
-power plant intakes -desalinization plants
-critical public use areas at risk (e.g. fire departments or e.g. hazardous fumes)

The second priority group is thoroughly treated in Section 9800. Section 9800 is a catalog of identified resources at risk including sensitive ecological sites, other ecological resources, cultural/historic concerns, and economic concerns. Ecological sites are given a ranking of sensitivity of A, B, or C which reflects the sensitivity of the site and the relative ecological consequences if the site is impacted by oil or other pollutants. The rationale for this ranking is in the introduction to Section 9800, and the ranking may be useful if response resources are limited.

Economic sites have a D, E, or F designation to reflect the type of resources at risk. However, as mentioned before, resources and sites determined to be critical to the preservation of human health and safety – such as drinking water intakes, power plant intakes and desalinization plants – afford first priority, ahead of environmentally sensitive sites and economic sites.

The UC will make the final decision regarding protection priorities for the environmentally sensitive and economically significant areas. In order to further assist the UC, additional prioritization of equally categorized areas that could be impacted may, in the future, be included in this plan. This will allow the UC to determine which priority sites should be protected when initial resources will only allow the protection of a few of them.

The UC may utilize the predetermined response strategies for environmentally sensitive sites and economically significant sites. Section 9800 includes response strategy recommendations for sensitive sites should be implemented as indicated in the included site strategy sheets. However, the UC and the responders should remain flexible and be receptive to additional information when implementing the booming plan or other countermeasures. Factors such as unusually high winds, strong tidal currents or freshets, equipment limitations, bottom conditions, and the type of oil can have a significant effect on the proposed strategy. Modifications to the preplanned strategies should be expected.

In addition to the seasonal variances, the protection priority of an entire area could change. For example, if the Scientific Support Coordinator (SSC) or a Department of Fish and Game (DFG) biologist determines that a certain section of marshland or coastline previously categorized as a lower priority (or not categorized at all) is currently a breeding ground for an endangered species, then protection of that site may be afforded the utmost priority even at the expense of a neighboring site previously categorized with a rank of “A”. In contrary, sensitive locales which may be already impacted or inevitable impacted may be used to collect or retain oil so that other nearby sites can be protected.

3210.3 Protection

Under the Recovery and Protection Branch Director, the Protection Group Supervisor is responsible for the deployment of containment, diversion, and absorbing boom in designated locations. Depending on the size of the incident, the Protection Group may be further divided into teams, task forces and single resources.

Refer to the Incident Management Hand Book (IMH) for position responsibilities

The goal of most oil containment and recovery strategies is to collect the spilled oil from the water and prevent it from reaching sensitive resources. Frequently, however, this is not possible and sensitive resources are oiled in spite of response efforts, especially during large oil spills. Often the goal will be to minimize environmental impact using a variety of booming, containment and recovery techniques.

The following are techniques that can be implemented by the Booming Branch of the Operations section to contain spilled oil on water or as a means to direct it away from sensitive natural resources or cultural amenities. Shoreline cleanup and treatment methods are discussed in more detail later in this Section. For swift current environments which are common in SF Bay, Humboldt Bay, and many coastal estuaries, the USCG publication, **Oil Spill Response in Fast Currents - A Field Guide** (Hansen & Coe, 2001) provides an excellent summary of techniques and equipment which have success in such challenging environments.

Exclusionary booming is performed prior to the advance of the oil and is used to prevent or exclude oil from entering a harbor inlet, slough, marsh or estuary. Skirted boom can be used for this type of booming. Factors that need to be considered are: type and size of boom, natural outflow of the body of water, wind, tide and currents or a combination of both.

These factors can be predetermined by establishment of a priority system, training, local knowledge of underwater topography, weather conditions and boom anchoring capabilities. It is important to remember that the boom needs to be tended and monitored as weather and tidal conditions can change.

Diversionary booming should be set so that oil movement is reduced to under 0.7 knots. This can be accomplished by angling the boom in relation to the current's direction, reducing the velocity of the floating oil in relation to the boom. Diversionary or deflection booms can be set up in series along a waterway to increase their effectiveness. As stated before, the boom(s) needs to be tended and monitored as weather and tidal conditions can change.

3210.4 Containment and Protection Options

The most effective strategy to aid in oil collection and removal is containment. All oil removal and recovery techniques are most effective where oil is thickest. Typically, this is at or near the release site. The most effective use of resources is to insure containment at the primary release site. This must include surrounding the release site with impervious oil barriers including multiple layers of boom as necessary. As oil escapes, containment it becomes increasingly difficult to recover and recovery success diminishes rapidly.

Inevitable oil escapes containment, and additional measures must be included to deal with oil escaping containment. This is particularly necessary where oil booming is subject to winds and waves or strong currents; oil entrains or is splashed over boom. To counter oil escapement, deployments should include preplanning to anticipate and control escapement. Two measures must be incorporated.

First, configure containment booms to focus and limit any oil escapement to preplanned points along the boom perimeter, for both the ebb and flood tides; these points should be selected to optimize recovery of any escaping oil. A skimmer should then be positioned just downstream from these locations where it can continue skimming escaping oil throughout the 24 hour tide cycle regardless of light or weather conditions. This is very practical in bay conditions where both boom and skimmers can be positioned by anchoring. In open ocean conditions it is more difficult to implement.

Second, employ secondary booming in the spill area. This strategy is most effective in the near shore areas typical in bays, though opportunities may occur in open water to slow spread from the primary containment area. In bays, spill locations are often near shorelines. Shorelines act as containment since they prevent free movement of oil. Also, winds and tides often drive oil toward the shore. Once oil is ashore or in a low current area, contain and recover it there, if possible, to minimize its movement and contamination of other locales. Wherever possible every attempt should be made to contain and collect oil along shorelines which are already oiled. Shores which have already been impacted can no longer be protected; therefore, use them as containment and recovery sites. The objective then changes from protection to containment and preventing oil escape to un-effected areas.

If the oil moves from a near shore spill site to open water, the recovery potential will diminish dramatically. As with primary containment, escapement from secondary containment booms is predictable and skimmers should be positioned to capture oil throughout the day and night, particularly during the ebb tide. These secondary shoreline confinement strategies should always be reviewed with the Resources at Risk Specialist.

The use of containment resources, primarily boom, at the source of the discharge may be an effective countermeasure depending on the weather, sea, tidal condition, type and volume of oil. However, in certain circumstances, it may be a more efficient and appropriate use of resources if they were applied to the open water recovery or resource protection mission of the cleanup. This decision must be weighed against the appearance that inadequate action is taking place at the source of the discharge, especially if the vessel, facility or pipeline is still discharging oil. In some circumstances it may be advisable <u>not</u> to contain the discharged oil alongside the vessel or facility due to a potential increase of fire, explosion, or health hazard.

Before spilled oil can be effectively recovered, the spreading of the oil must be controlled and the oil contained in an area accessible to oil recovery devices. In this section various oil containment strategies are discussed. Generally, spilled oil is contained using oil containment boom. Typical boom has a flotation section that provides a barrier on and above the water surface and a skirt section that provides a barrier below the water surface. The physical dimensions of the boom to be used for a particular spill will be dependent on local conditions. In the open ocean it may be necessary to use a boom that is several feet tall. In a protected marsh, a boom that is only a few inches tall may be appropriate.

There are limitations on the effectiveness of any boom. Oil will be lost if the conditions are such that there is splash-over from breaking waves. Oil will also be carried under the boom if it is deployed in such a way that currents cause the oil to impact the boom with a velocity perpendicular to the boom of greater than 0.7 knots. Once a boom has been deployed, it may be necessary to reposition it due to changing tides and currents. It is desirable to have personnel available to readjust the boom as required. In all cases of boom deployment, consideration must be given to protecting the safety of those involved in the activity.

Oil spilled on open water is normally contained using boom. The boom will be deployed using vessels that will tow the boom around the perimeter of the oil spill. The type of boom to be deployed will depend on local conditions, including sea state, tides, currents and wind. To be most effective, booming on open water must be done as soon as possible after a spill.

Containment booming is used to prevent spreading and to concentrate the oil so it can be skimmed or vacuumed. Factors that need to be considered are: type and size of boom required for weather, winds, tides and currents in the vicinity of potential spill areas; the type of deployment vessel needed; the amount of boom needed for effective containment and available skimming capabilities. Fixed or natural anchor points should be selected. These factors can be predetermined by emphasizing worst case spill scenarios and using local knowledge of weather and sea conditions.

Sorbent booming is useful when the amount of oil is minimal, when tides and currents are light, or when shorelines require protection. Heavier oil can be recovered using absorbents (oil “sticks” to material) and lighter fuels generally are recovered using adsorbents (sausage, sweep, or diapers). Sorbent booming can also be used as a backup for other types of booming to recover product that may have entrained past the primary barrier.

Factors that need to be considered are: wind and wave action; type of sorbent required, i.e., rocky or sandy shoreline, marsh area, etc.; and type and viscosity of product to be recovered.

3210.5 Containment and Recovery Options for Nonfloating Oils

Techniques for tracking and mapping the location of nonfloating oil throughout a spill and subsequent cleanup are critical to the effective containment and recovery of nonfloating oil in the water column or deposited on the seabed. As a practical guide to determining which tracking and mapping options are most appropriate, Figure 3-1 provides a typical decision tree based on oil density and water depth.

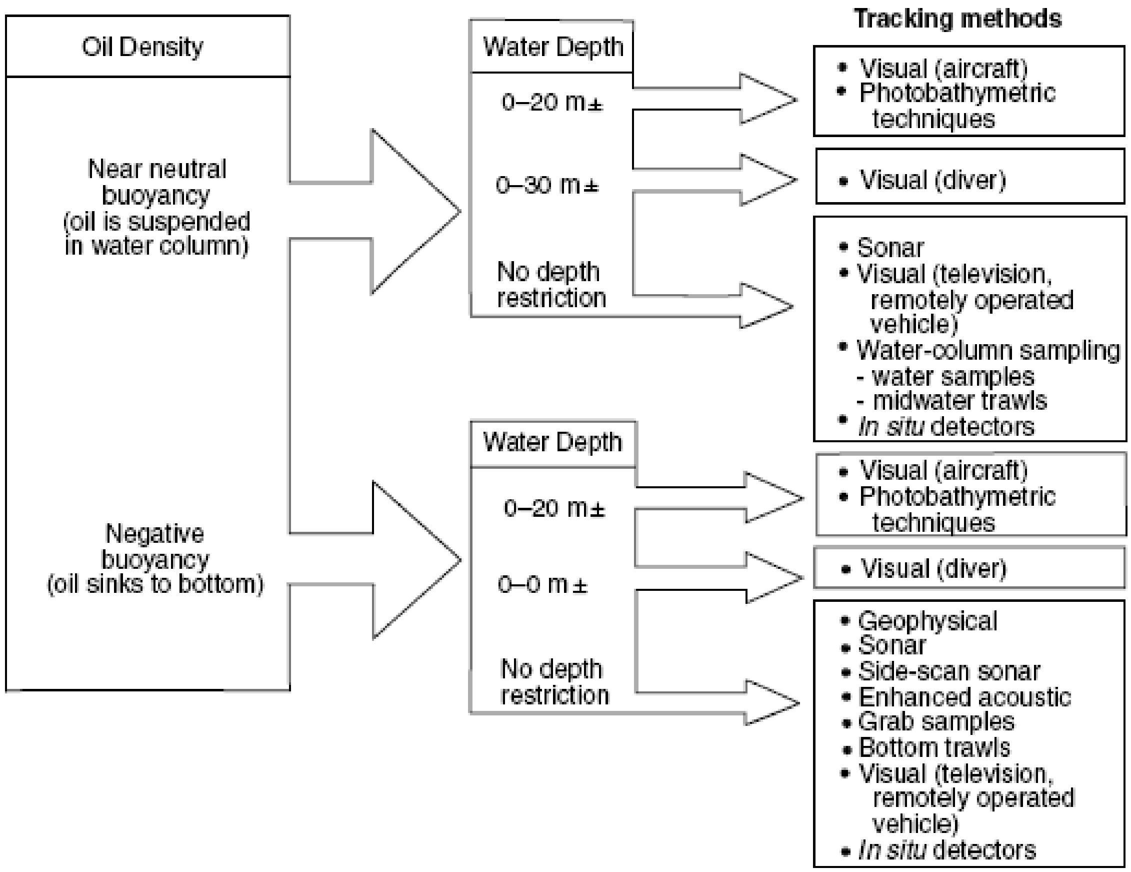

FIGURE 3-1 Decision tree based on oil density and water depth. Source: Castle et al., 1995.

Nonfloating oil that is spilled and transported subsurface either remains suspended in the water column or is deposited on the seabed, usually after interaction with suspended sediments or sand. Different strategies for containing these oils can be used depending on the location of the oil.

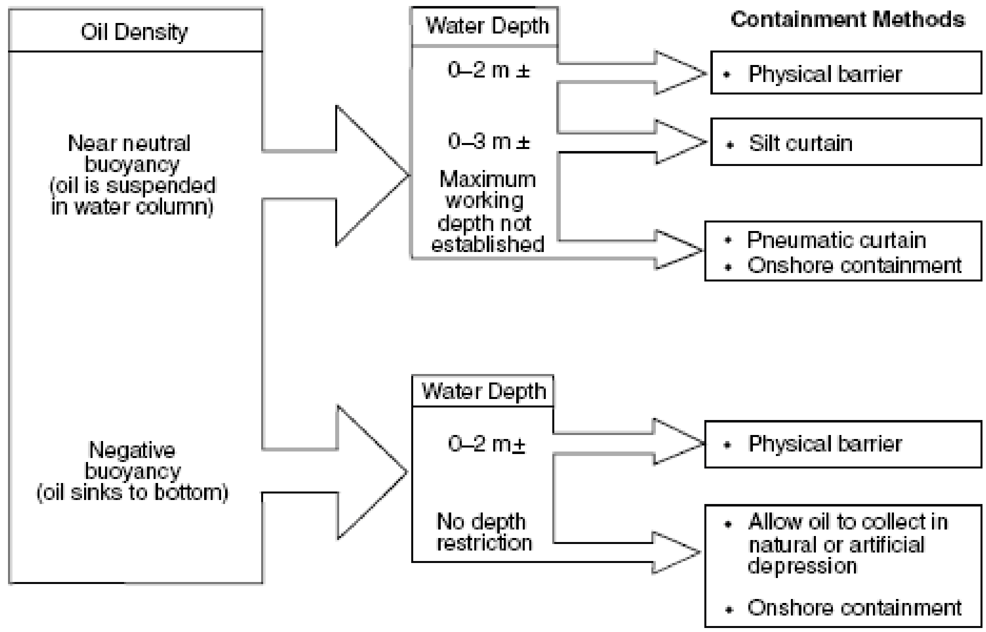

FIGURE 3-2 Decision tree for containment options for sunken oil. Source: Castle et al., 1995.

The recovery of sunken oil has proven to be very difficult and expensive because the oil is usually widely dispersed. Several of the most widely used recovery methods are manual removal, pump and vacuum systems, nets and trawls, dredging, and onshore recovery.

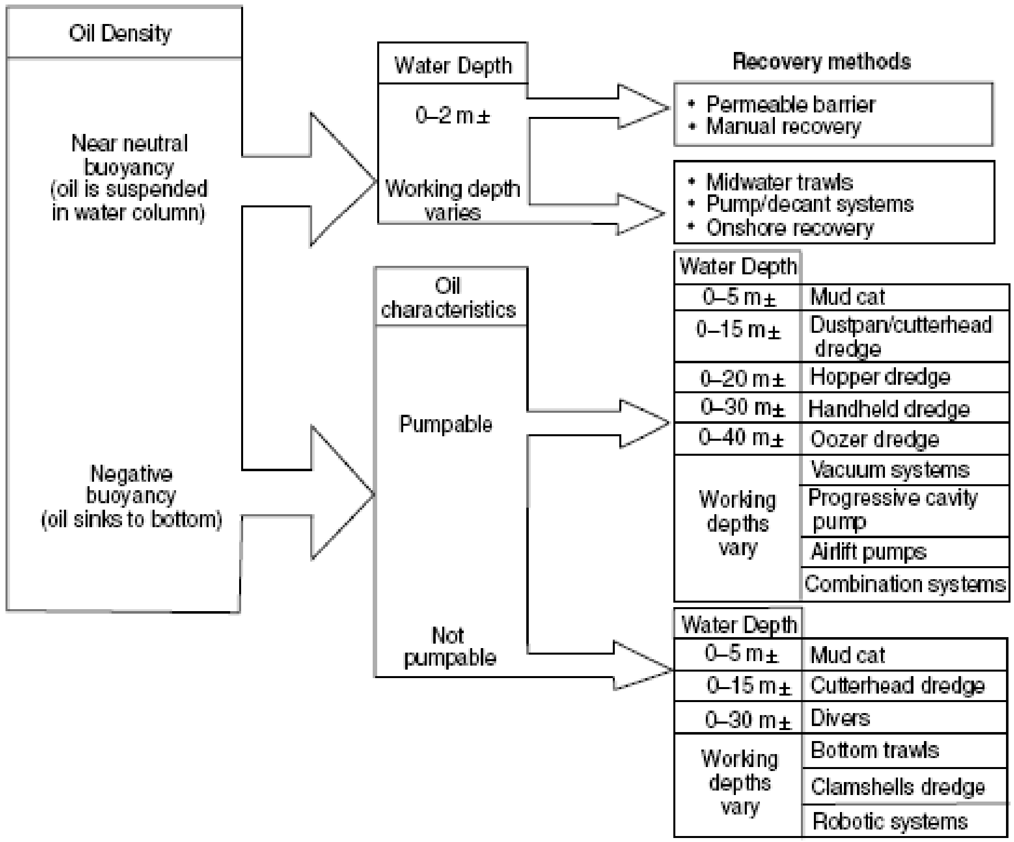

FIGURE 3-3 Decision tree for recovery options for sunken oil. Source: Castle et al., 1995.

For specific containment and recovery methods refer to Chapter 3 of the National Academy of Sciences (NAS) "Spills of Nonfloating Oils: Risk and Response" contained in Appendix XXVIII of the Region 9 Contingency Pan.

3220 On-Water Recovery

Oil removal/recovery in open water is accomplished through the use of skimming devices once the oil has been contained. Skimmers can be freestanding in which the skimmer is a separate piece of equipment which pumps the oil-water mixture from the contained surface into tanks on a vessel. These skimmers are usually driven by hydraulic units on board a vessel. Self-propelled skimmers have a skimmer as an integral part of the vessel. The skimming vessel positions itself at the head of a concentrated or contained pool of oil and recovers the oil into tanks on board the vessel. There is also a type of skimmer in which the weir or collection zone of the skimmer is an integral part of the boom which is in contact with the oil. The pumping and oil collection is done on the vessel which is close to the skimmer.

"Vessels of opportunity", such as fishing vessels, may be used to deploy or tow boom and, depending on their size, be equipped with skimming equipment. They need to have adequate deck space and lifting cranes to carry the necessary equipment. The Coast Guard's Vessel of Opportunity Skimming System (VOSS) could be deployed on a variety of vessels.

To be most effective, oil spill recovery equipment must be directed to the location of the thickest oil accumulation. Observers on vessels at water level are unable to see a vast area and are unable to recognize the most optimum skimming locations. Skimming activities are best directed by trained observers aloft in helicopters. One observer may be able to direct several skimming units to optimum skimming locations. During hours of darkness or poor visibility, tracking devices that emit radio location signals can be placed in the spilled oil to trace the oil movement. Remote sensing systems have been developed which can track oil movement even in darkness and poor visibility. The sensor is mounted in an aircraft that overflies the spill area. The sensor systems include Side Looking Airborne Radar (SLAR), infrared and radiometric.

Skimming Operations in High Current Environments:

In San Francisco Bay it is not uncommon to encounter currents in excess of 3 to 4 knots. With appropriate skimmer operations, it is possible to recover spilled oil in these high current areas. Standard skimming techniques must be modified somewhat to optimize oil recovery.

To be successful, most containment and skimming systems must encounter oil at speeds of less than one knot. Typically skimmers are operated in conjunction with containment boom. If oil encounters the boom/skimming system with a perpendicular velocity greater than one knot, the oil will carry under the boom and be lost. Therefore, the most important consideration for skimming in high currents is to keep the speed of the skimming system below one knot relative to the water’s surface. As a basic example: A skimmer pointed upstream in a 5 knot current would actually be proceeding downstream or backwards at four knots to keep its velocity relative to the water’s surface at one knot. Gauging a skimmer’s velocity relative to the water’s surface can be somewhat difficult. Often the most reliable method is for the skimmer operator to closely monitor the skimming system. They should look for signs of oil undercarry as well as ensuring the integrity of the containment system. As current speeds change so must the speed of the skimmer. The skimmer monitoring can be aided by using a helicopter observer. The observer can tell if oil is being lost by the skimmer as well as direct the skimmer to the best skimming location.

Often time’s boom is deployed in front of the skimmers forming a V thus directing oil into the skimmer. The practice increases the area being covered by the skimmer. Ideally this V should be as wide as possible. In high currents, as the V width is increased the speed of the oil encountering the boom perpendicularly is increased to avoid oil undercarry.

In that oil will spread most quickly in the direction of the current flow, skimmers should operate in an up and down-stream orientation. The oil slick will be elongated in the direction of the currents. Skimmers will encounter the most oil as they proceed up and down stream within the slick. Operating back and forth across stream and across the slick will result in sub-optimal recovery efficiency.

Oil recovery techniques and equipment are different in nearshore/shallow water locations than open water. Shallow draft vessels and smaller boom and skimmers are used in these situations. These vessels can maneuver into tight places behind and under wharfs or in sloughs and can actually skim next to shore in many nearshore locations.

Strategies for nearshore cleanup can differ depending on the depth of the water and the location. Nearshore operations, within a bay or inlet, will also require shallow draft vessels, workboats and skimmers. However, the vessels may only be operable at high tide. At or near low tide, the operation may evolve into a shoreline cleanup operation. Any boom towing boats or skimmers must be able to withstand going aground without sustaining major damage.

Coastal shallow water or nearshore strategies will differ in certain respects. In addition to the need for small, shallow draft vessels, specialized vessels such as kelp cutters and harvesters may also be needed. California's rocky coast can make nearshore operations difficult and even dangerous during high surf and winter conditions. Once again, the safety of personnel involved in these operations is the Unified Command's paramount concern.

Under the Recovery and Protection Branch Director, the On Water Recovery Group Supervisor is responsible for managing on water recovery operations in compliance with the Incident Action Plan. The Group may be further divided into teams, task forces and single resources.

Refer to the Incident Management Hand Book (IMH) for position responsibilities.

3230 Shoreside Recovery

There are predictable locales where recovery efforts can be optimized at shorelines. There are two situations where oil collection should be vigorously attempted at the shoreline: 1) places where oil naturally collects at the shoreline because of winds and currents; and 2) diversion and capture of oil as it flows past or along shorelines and points with low environmental sensitivities.

(The reason oil recollects is that oil is a substance that spreads primarily in two dimensions on the water surface while water moves in three dimensions; oil will spread and thin, but it will also accumulate at predictable locales; it will accumulate wherever water has downward currents: such as tide rips along mud flats, and at windward coves.) *Natural collection points* for debris are on all shorelines. These points are so predictable that it is very difficult to keep oil off even with pre-deployments. An alternative is to anticipate such collections and leverage the opportunity for oil capture. This entails developing the site for collection while limiting and focusing undesirable impacts to the habitat. Though this entails risk, the trade-off is likely to be nominal since the impacts are virtually inevitable.

Diversions to shores with low environmental sensitivities are a desirable alternative to the unmitigated spread of oil. As described above, oil spreads rapidly on open water and effectual on-water skimming is difficult in a high current environment. Diversion can shunt oil out of the high current and into quiet water capture points at shore. It can be an effective addition to on-water skimming recovery.

Here are the operational considerations when establishing a shoreline collection site when oil is moving along or near shore. Boom should be positioned at an acute angle to the current to move oil toward the shore collection. Cascading boom arrangements may be necessary. Once oil is at the shoreline, it may be necessary to deploy additional boom to trap the accumulated oil at the shore collection site when the tide reverses. Good land accessibility is important part of selecting capture sites since it permits site support and easy removal of collected oil. Though some natural collection sites may have poor land access, they may be important accumulation points which can be exploited effectively via water.

Deployments of this type should be made only per recommendation of the ACP, Incident Action Plan or with the direction of the Resources at Risk Specialist and the Unified Command.

Due to the large amount of prograding mudflats and marshes in San Pablo, Suisun and South San Francisco Bays, and the difficulty in protecting them, the recovery of free-floating oil threatening these areas is paramount.

The primary oil recovery strategy for all of these areas is to keep the oil in the deeper channels so that the thickest concentrations of oil may be attacked with as many high skimming capacity vessels as possible. The medium and lower capacity skimmers are generally more mobile and can be deployed outwardly along the leading edge of the oil. The skimmers will work in conjunction with sets of vessels that will tow 500-1,000 foot lengths of containment boom in a U-shaped configuration. Aerial support will be necessary to efficiently direct the skimmers and the containment vessels to the highest concentrations of oil.

The water depths of San Pablo, Suisun and South San Francisco Bay's decline rapidly as you depart from the marked channels. The use of more shallow draft vessels will become a necessity. The shallow draft vessels will be utilized in the same skimming configuration as the larger skimming vessels.

The on-water recovery of the oil will be supported by tactical diversion or deflection booming at the major prominences located within the greater San Pablo, Suisun and San Francisco Bays. The actual deployment sites will be determined at the time of the incident. Many of the site specific strategies, included in the next Section, propose similar deflection booming at selected points of land. On the average, approximately 1,000-1,500 feet of deflection boom will be suitable for each deployment. It can be deployed from shore or water. The boom may be placed in multiple sections and anchored or, if conditions allow, deployed in one large continuous section.

Due to the high tidal currents in many of the areas, the deployment teams will need to constantly maintain and tend the booms. The boom's angle will have to be changed with each tidal cycle to keep the oil in the main channels and the deeper waters. An option, if resources and time are available, is to leave the initially deployed boom in place and deploy additional deflection booms for the opposite tidal current direction.

For Suisun Bay and Carquinez Straits, deflection booms may be deployed from Dillon Point, Point Carquinez, Army Point, Martinez marsh and Bull's Head Point. In addition, if the oil is pushed north towards the mouth of Grizzly Bay, vessels anchored on the outside of the Suisun Bay reserve fleet could be used as anchor points for the deployment of additional deflection or collection booms.

For San Pablo Bay, deflection booms may be deployed from Point San Pablo, Point San Pedro, Pinole Point, Point Davis and at the western end of the Mare Island breakwater.

For San Francisco Bay, deflection booms may be deployed at Point Stuart, Peninsula Point, Point Chauncey, El Campo, Paradise Cay, Point San Quentin, Avisadero Point and Point San Bruno.

The southern part of San Francisco Bay and the upper reaches of Suisun Bay do not have enough land points or significant prominences to effectively deploy a sufficient amount of deflection or diversion booms. In these areas, or in areas where the deployed deflection booms will not extend far enough out to deflect or collect the oil, a series of booms (500 - 1,000 ft) may be deployed on the water in a parallel, cascading fashion. This use of deflection boom will also require constant attention and maintenance but could be effective in preventing a large concentration of oil from spreading into the nearly indefensible prograding mudflats and marshes.

Under the Recovery and Protection Branch Director, the Shore side Recovery Group Supervisor is responsible for managing shore side cleanup operations in compliance with the Incident Action Plan. The group may be further divided into Strike Teams, Task Forces and single resources.

The Incident Management Hand Book (IMH) for position responsibilities for the Shoreline Protection Branch and Branch Director.

3230.1 Shoreline Cleanup Options

The northern reaches of San Pablo and Suisun Bay are home to large expanses of prograding mud flats and marsh systems. These areas are particularly difficult to protectively boom and every effort should be made to contain and recover the oil before it approaches any of these mud flats.

The “macro” strategies for San Pablo, Suisun and South San Francisco Bay’s call for a series of deflection booms to be placed at several key points along the shoreline supplemented by a vigorous open-water skimming effort. If the oil recovery operations are not entirely effective and oil still threatens the prograding mudflats, intertidal barrier boom may be used to protect the mud flats.

A recommended deployment strategy is as follows: (1) Place harbor boom along the entire front of the mud flat, with the boom being anchored just offshore of the low-low tide line; and (2) in areas where wave entrainment of the harbor boom at high tide is considered to be a problem, place a line of boom across the upper mud flat near enough to the marsh to be away from the threat of wave entrainment. The boom positioned on the mud flat would rest on the flat at low tide and be of the type of construction that would prohibit oil from passing under it on the rising tide. The boom would eventually lift up off the tidal flat surface as the tide continues to rise.

Deployment of this type of boom and its supporting arrangement is extremely manpower intensive. It should only be implemented if there is a high probability that oil will reach the mud flats. It is envisioned that these resources would not be available until equipment began to cascade into the area sometime after the initial response. Other factors to consider in the use of this type of boom are:

water body type (open water, bay, tidal channel, inlet)
water current velocity
water depth
wave height
shore type (sand, gravel, boulder)

Generally, sediment berms, dikes and dams will most often be used to protect small coastal inlets or perhaps tidal channels serving wetlands and marshes when these channels are accessible. The object of berms, dikes and dams is to keep oil outside an inlet because there are often abundant natural resources and economically significant areas that use the sheltered waters of bays and estuaries within.

Occasionally, dikes and dams have been used across a channel to contain the oil within a portion of marsh in order to prevent widespread contamination of other resources.

Dikes and dams are not practical when currents are great, waters are deep and waves are large. Also, beaches with abundant sand are generally the most suitable for building dikes and dams. Berms can be built above the active beach face to prevent oil contamination of high beach during spring tides. Alternative strategies should be prepared and the necessary supplies and equipment in place should a berm, dike or dam fail.

3230.11 Shoreline Operational Divisions

Refer to Section 9800 for detailed information for each county or GRA. Most of the six California Area Committees have pre-identified “Shoreline Operational Divisions.” When these have been pre-identified, they are included in Section 9800 along with other GRA information and shoreline operational division maps and descriptions area available. Shoreline Operational Divisions are numbered by county code and a single alpha character, e.g., **LA-C** for operational division C of LA County. This system is uniform throughout California.

<u>On-Water Operational Divisions or other special operational divisions</u> may be identified by using a double alpha code such as **AA** or **BB**. Area Committees have pre-designated and pre-numbered shoreline operational divisions, because local geography, access, and historic spill responses dictate predictable patterns of shoreline response and cleanup.

3230.2 Pre-Beach Cleanup

While it is generally not possible to avoid the generation of oily debris resulting from the contact of floating oil with waterborne solids, it is possible to avoid the generation of oily debris in the coastal inter-tidal zone if the anticipated area of oil impact can be cleaned prior to stranding of the spilled oil. This has been successfully accomplished in a small number of past spills (W. Schumaker, personal communication). Personnel can be deployed to remove debris from beach intertidal areas to above the high tide line in order to prevent oiling of stranded debris/trash. It is important to note that such crews are not likely to be certified as required under OSHA 1910.120 and can only perform this task prior to the stranding of spilled oil. A safety/industrial hygiene specialist should be consulted regarding the limitations of these crews and the effective establishment of exclusion zones in the area of beach impact.

3230.3 Storage

To expedite removal of spilled oil, refined products, and contaminated material from marine waters during an emergency response, temporary storage sites may be erected at appropriate shore locations. The transportation of oil and contaminated material to temporary storage sites during the emergency response is exempt from handling and permitting requirements [Title 22, Sec. 66264.1(g)(8)]. The on-site California Environmental Protection Agency, Department of Toxic Substance Control (DTSC) representative or duty officer [(213) 255-2002] should be contacted for approval. If a Unified Command is established, OSPR will facilitate the contact with DTSC through their liaison function.

Temporary storage sites should be available at an onshore location convenient to the recovery operations to temporarily store recovered petroleum products and contaminated materials and debris. A temporary storage site may require an emergency permit from the California Coastal Commission. For information on temporary permits within the coastal zone, call the Emergency Resources Unit at (415) 904-5200.

Placement of the temporary facility must be done with the concurrence of the USCG and state OSC, DTSC, the local Regional Water Quality Control Board (RWQCB), and the local health, fire and emergency services departments. If a Unified Command is established, OSPR will facilitate the contact of the state and local government agencies through their liaison function.

Temporary storage facilities can include Baker tanks, tank trucks, oil drums, or empty fuel storage tanks. A temporary storage site may require an emergency permit from the California Coastal Commission (CCC) or the San Francisco Bay Conservation and Development Commission (BCDC). For information on emergency permits within the coastal zone, call the Oil Spill Unit at (415) 904-5200.

Petroleum and petroleum contaminated cleanup materials can potentially be treated at a temporary storage site. One of the treatment processes that may be used is Transportable Treatment Units (TTU). The most likely treatment process undertaken with a TTU will be separation of sea water from collected petroleum. Another method employed for separating water is decanting water from temporary storage tanks.

Any water generated through the separation of petroleum and sea water may be potentially discharged to a sanitary sewer system or back to marine waters. The sanitary sewer discharge will require a permit from the local sanitation district which will establish effluent requirements for the discharged water. Should a sanitation district not allow the discharge of water to its system, the recovered sea water would either be discharged back to the adjacent marine waters or transported off-site for disposal. The discharge of recovered sea water to state waters will require a NPDES permit from the local RWQCB. RCP Appendix VIII MOUs includes a MOU between the State Water Resources Control Board and OSPR for decanting in State ocean waters.

A portable incinerator may be another type of TTU available during a spill response for use with contaminated material. The use of an incinerator will require a permit from the local air quality agency. The potential use of any TTU and regulatory standards must be discussed with DTSC.

Recovered petroleum and contaminated debris not recycled must be characterized to determine their waste classification before the waste can be shipped to a proper waste management facility for final disposal. The actual testing may be conducted on representative samples of each type of waste by a State of California certified laboratory.

It is the responsibility of the generator/RP to have petroleum and contaminated material managed as waste accurately classified as hazardous or non-hazardous for proper disposition [22 CCR 66260.200(c)]. A generator who incorrectly determines and manages a hazardous waste is in violation of the hazardous waste requirements in 22 CCR and is subject to DTSC enforcement action.

Title 22, CCR 66264.13 and 66265.13 states that before an owner or operator of a treatment, storage, or disposal facility transfers, treats or disposes of any hazardous waste, the owner or operator shall obtain a detailed chemical and physical analysis of a representative sample of the waste. Characterization of the waste must be provided to DTSC (via profile sheet). The DTSC then designates the waste acceptable prior to shipment. State criteria for characterizing a waste hazardous or nonhazardous is found in 22 CCR66261.10 and 66261.20-66261.24 while federal criteria is presented in 40 CFR 261.30-261.33. These criteria can apply to any oily-water, sorbents, booms, and debris generated as a result of an oil spill clean up. Based on waste characterization, the wastes can be further defined as either a Federal Resource Conservation and Recovery Act (RCRA) waste (hazardous waste regulated under federal regulations), non-RCRA waste (hazardous waste regulated under California regulations), or non-hazardous waste. Non-hazardous waste in this instance is defined as designated waste per 23 CCR 25522. Once the waste is characterized, disposition options can then be selected. Removal of recovered material from temporary storage will require the authorization of the on-scene coordinator.

Recovered petroleum product not accepted at a refinery or recycling facility and contaminated material must be transported to an approved waste management facility. The type of waste management facility will be based on the results of the waste characterization performed.

3240 Disposal

Under the Recovery and Protection Branch Director, the Supervisor of the Disposal Group Supervisor is responsible for coordinating the on site activities of personnel engaged in collecting, storing, transporting, and disposing of waste materials. Depending on the size and location of the spill, the disposal groups may be further divided into teams, task forces, and single resources.

Refer to the Incident Management Hand Book (IMH) for position responsibilities.

See section 3008 of the Region 9 Contingency Plan for additional information.

3240.1 Waste Management and Temporary Storage Options

Waste classified as hazardous under either federal or state regulations must be transported to a permitted or interim status hazardous waste facility. Hauling of the waste must be done by a state licensed hazardous materials hauler. The licensed hauler must have a U.S. EPA I.D. number and State transporter I.D. number. Prior to removal of the hazardous material from temporary storage, a uniform hazardous waste manifest (form DHS-8022A) must be prepared by the generator (RP or his representative) for recovered petroleum and other contaminated materials (22 CCR 6626.20 - 6626.23). If assistance is required for manifesting, the RP may request it from the on-scene DTSC representative or the state DTSC duty officer (916) 3233600.

All hazardous materials shipped off-site must be transported in compliance with applicable regulations. These include the RCRA regulations in 40 CFR 262-263, DOT Hazardous Materials Regulations (49 CFR 171-178), and any applicable state regulations (22 CCR 6626.20-6626.23).

Waste determined to be non-hazardous but designated waste (23 CCR 2522) will be transported to a Class II waste management facility. Manifesting of the waste is not required but a Bill of Lading is required for transportation. The appropriate Regional Water Quality Control Board (RWQCB, see section 5620) and local health department should be contacted to determine what waste management facility will accept the waste and any additional test requirements the facility might require. Removal of non-hazardous waste from temporary storage will require authorization of the on-scene coordinator.

One of the major problems associated with an oil spill response is the disposal of collected product and contaminated cleanup materials, soil, and debris. Each category of waste has it own type of response and management problem. The following discussion presents a general approach to the management of the various types of wastes collected during an oil spill.

Under California law, material released or discharged to marine waters of the state are defined as waste. Once the final disposition of a specific waste is determined, the waste may be redefined as a product or material and no longer will be subject to waste management requirements.

Crude oil spilled to marine waters, recovered, and transported to a refinery will be considered a product and will not be subject to waste management regulations [California Health and Safety Code (CHSC), 25250.3]. The collected crude oil must be shipped to the refinery of original destination or a refinery that can accept the spilled crude oil. Refined petroleum products that are recovered from marine waters may also be handled as a product if they can be used for their originally intended purpose (i.e. fuel, fuel oil, etc.)(CHSC 25250.3).

There are other avenues by which recovered petroleum may be managed as a material (CHSC 25143.2). These approaches include recycling the petroleum through incineration, as a fuel, a substitute for raw material feedstock, or as an ingredient used in the production of a product (i.e. asphalt). The California Environmental Protection Agency, Department of Toxic Substances Control (DTSC) should be consulted for more information on these and other management options. State law requires the consideration of recycling, therefore recycling should be a top priority and will be undertaken if at all possible.

Recovered petroleum “products” that are not accepted by a refinery or that can not be recycled must be managed as a waste. In order that the appropriate management mechanism is determined for the recovered petroleum, the waste must be characterized by a state certified laboratory to determine if the waste is hazardous or non-hazardous. It is the responsibility of the Responsible Party (RP) to have the waste accurately characterized for proper disposition [Title 22, Sec. 66260.200(c) of the California Code of Regulations].

Depending upon climatic conditions and material compatibilities of personal protective equipment (PPE), waste can be minimized through the selection of reusable equipment, when possible. For instance, heavy gloves and boots which can be effectively decontaminated and reused can minimize the generation of oil-contaminated disposable gloves and boots as long as such equipment use is approved by the site safety officer. Reusable rain gear may also be used instead of disposable suits, if approved. Such decisions should be made early in the response process in order to minimize generating containerized, contaminated PPE which is generally disposed at Class I facilities.

Both oil and oily-water recovered from skimming operations should be offloaded to facilities where it can be effectively recycled/managed with established process and treatment streams. Such facilities would include terminals, refineries and commercial rerefiners/reclaimers/ recyclers. These facilities can often provide temporary tank storage, when necessary. Oiled debris which is recovered with skimmed oil should be maintained in secure, temporary storage until it is sufficiently characterized for disposal.

Synthetic sorbents (i.e., pads, sweeps, booms) have become standard response materials in the "mechanical recovery" of spilled oil. Their oleophilic, hydrophobic character makes them efficient at separating oil and water and they are routinely used to recover oil from solid surfaces as well (e.g., rubble, cobble and boulder shorelines; equipment/gear; vessels; etc.). Since oiled sorbent material often constitutes a substantial percentage of the oily solid waste generated during spill response and cleanup, opportunities for minimizing this waste volume should be considered.

Some sorbents are designed to be reuseable (i.e., mechanized rope-mop skimmers) or can be recycled onsite with inexpensive gear (e.g., appropriate barrel-mounted wringers). Sorbent manufacturers' instructions should be followed regarding the limits of effective reuse for their individual products. It is also possible to replace sorbent sweeps and booms with recyclable boom and other appropriate gear in circumstances where floating oil can be efficiently recovered without generating oiled sorbents. For example, in good-access, low energy shoreline areas (harbors, bays, inlets), it may be possible to use containment-boom and recover the trapped oil with vacuum trucks instead of contaminating large volumes of sorbent.

While the volume of petroleum-contaminated soil associated with coastal spills is generally lower than such volumes resulting from large inland spills, opportunities for recycling/reuse should be considered. For soils satisfying the waste profiling requirements of the state and commercial facilities, beneficial reuse as daily landfill cover after appropriate treatment is an available option in California (see Response Resources lists). Recycling of oil-contaminated soil as aggregate in cold-mix and hot batch asphalt is available at four facilities in the State of Washington (Nash, et. al, 1992). Furthermore, a recently completed study of the incorporation of oily/solid residuals into construction materials concluded that a large market exists in California and that these recycling/reuse opportunities should be pursued and encouraged (Mittelhauser Corporation, 1992).

It is important to note that both the costs and benefits of such recycling (less than $100/ton and low future liability) versus disposal in a California Class I or II disposal facility (greater than $100/ton and moderate to high future liability) are substantial.

Removal of contaminated soil from temporary storage will require authorization of the on-scene coordinator.

3240.2 Decanting Policy

In order to maximize skimmer efficiency and effectiveness, water should be decanted to the spill impact area with the approval of the federal OSC and relevant state agency representatives. Operational standards (e.g., decanting only in the impact area where water depth is sufficient; no free oil) should be established as soon as skimming is initiated. In federal waters, decanting can be approved through a request to the federal OSC. There is a decanting MOU between DFG/OSPR and the State Water Resources Control Board regarding decanting in ocean waters (See RCP Appdx VIII). In other in State waters, approval must be secured from the Regional Water Quality Control Board.

Oil recovered at sea typically contains significant amounts of sea water. In order to maintain the efficiency of the skimming process this water must be separated/decanted from the oil and discharged back to the ocean during recovery operations. Separated sea water typically contains elevated levels of hydrocarbons and thus the discharge of this material may constitute a discharge of a pollutant. This issue is presently being discussed with regulatory agencies to determine if a National Pollution Discharge Elimination System (NPDES) permit, or a waiver from the permit, is required before separated/decanted water may be discharged back into state waters. The “discharge” of separated/decanted water is recognized by the USCG On-Scene Coordinator as an integral part of offshore skimming operations and as an excellent waste minimization tool. Therefore, the USCG OSC or his/her representative may authorize the discharge of separated/decanted water back into the catenary area of a boom/skimming system outside of State waters (3 miles). The exception to this will be in NOAA Marine Sanctuary waters.

With the addition of the Monterey Bay National Marine Sanctuary the ocean and ocean coastline, with the exception of a minor portion north of Bodega Head, are part of one of three national marine sanctuaries: Cordell Bank National Marine Sanctuary, Gulf of the Farallones National Marine Sanctuary, or the Monterey Bay National Marine Sanctuary. Federal law prohibits the discharge of material, such as separated water, to marine sanctuaries unless permitted by the Administrator of the sanctuary program. Negotiations are presently under way seeking pre-approval to discharge separated waters during an emergency response to oil spills within the sanctuaries. Until pre-approval is obtained, a permit for the discharge of separated water must be obtained from the Assistant Administrator of the Sanctuary Program (202-6064122) before any discharge can take place.

Contaminated debris, including organic material, contaminated cleanup equipment (i.e. booms, pompoms, sorbents, etc.) and other contaminated materials that cannot be recycled must be managed as a waste. The materials must also be characterized before the appropriate waste management option is determined.

Handling of oiled wildlife and carcasses is not permitted by law unless under the direction of California Department of Fish and Game, Office of Spill Prevention and Response (OSPR) representatives who are responsible for wildlife rehabilitation and collection of carcasses for natural resource damage assessment (NRDA) investigations. The identification and location of OSPR representatives can be provided by the Unified Command Center. Collection, handling, and disposal should only proceed at the direction of OSPR which is the designated responsible trustee. RCP Appendices XXII (a) and (b), the California Wildlife Response Plan, provides details about handling and preservation of oiled wildlife and carcasses.

3250 Decon

Under the Recovery and Protection Branch Director, the Decontamination Group Supervisor is responsible for decontamination of personnel and response equipment in compliance with approved statutes.

Refer to the Incident Management Hand Book (IMH) for position responsibilities.

See Section 3006 of the Region 9 Contingency Plan for additional information.

3260 Dispersants

The following process has been developed by the California Department of Fish and Game, Office of Spill Prevention and Response (OSPR) and the National Oceanic and Atmospheric Administration's Hazardous Materials Response and Assessment Division to provide for the timely and effective use of dispersants for oil spills in marine waters off California. The California Dispersant Plan, RCP 9 Appendix XII details the full process for engaging dispersants in US waters and State waters.

There are presently two commonly recognized approaches to remove significant quantities of spilled petroleum from marine surface waters. The most common technique involves mechanical skimming devices which typically remove less than 20% of the spilled petroleum (National Research Council [NRC], 1989). The second and more controversial method is the use of chemical agents (e.g. dispersants) to disperse oil into the water column. The effectiveness of chemical dispersants has been reported to range from zero to 100 percent depending on the type of petroleum spilled, the dispersant used, and the approach employed to estimate effectiveness (NRC, 1989).

Dispersants offer advantages over skimming technology when addressing dispersible oils. These include: dispersants can be applied in offshore or remote areas where the use of skimming vessels may be limited or response times protracted; dispersants can be used more effectively in sea states where skimming vessels may not be able to operate; and aerial application of dispersants can more quickly address larger areas of spilled petroleum than skimming technology. In addition, dispersants can be used in concert with mechanical skimming devices to increase the rate of surface oil removal.

Dispersion of petroleum into the water column does not alleviate the risk of petroleum-related impacts on the environment. Dispersant application does however, have the potential to accelerate cleanup of spilled petroleum on the surface of the water and at the same time reduce the risk of petroleum-related impacts on environmentally sensitive areas. In the case of California, environmentally sensitive areas include the productive intertidal regions, tidal inlets, tidal marshes and other wetland areas of the coastal islands and mainland and the surface waters where endangered marine mammals and large concentrations of sea birds might exist.

The controversial aspects of dispersants relate primarily to their effectiveness and toxicity. The effectiveness of dispersant application depends on many factors including: type and weathered state of spilled petroleum; the dispersant used; sea state; and application efficiency. It is thus difficult to predict in advance the precise effectiveness of dispersant application at any one spill due to the many controlling variables (NRC, 1989).

A recent review of dispersant toxicity studies (NRC, 1989) suggests that the present generation of dispersants do not themselves present a significant threat to marine life. The primary dispersant related threat to the environment comes from the dispersion of spilled oil constituents into the water column. However, studies show that the acute toxicity associated with dispersed oil is likely to be short term as the dispersed oil is typically diluted within hours to levels below those expected to produce impacts on the water column community. These findings, coupled with the potentially severe consequences to natural living resources when oil is on the water's surface or deposited within the productive intertidal regions suggest that when possible the dispersion of oil may be the best response choice after an oil spill has occurred.

The California marine oil spill response community relies almost exclusively on skimming technology to recover spilled petroleum in the open ocean. Though dispersants have been used in the past, consideration of and consent for their use has been slowed by the lack of an effective, well reasoned decision-making/approval process. Owing to the logistical constraints and relatively small window of opportunity in which dispersants may be effectively applied, the decision to use dispersants must be made in a timely fashion.

The purpose of this document is to combine an existing Quick Approval Zone policy for use of dispersant in the waters 15 nautical miles or more off the coast of California with California's draft policy for use of dispersants in state waters. The resulting dispersant use decision making policy is designed to address the use of dispersants in all waters off the coast of California.

In 1994, the 11th U.S. Coast Guard District and Region IX of the U.S.

Environmental Protection Agency (EPA) along with the State of California and other members of the Regional Response Team (RRT), developed a Quick Approval Zone Plan to expedite dispersant use in the offshore water of California at a "safe" distance from environmentally sensitive areas (Region 9 RRT. 1994). The actual area of the Quick Approval Zone (QAZ) is the waters from the Oregon border to a point 15 nautical miles from the Mexican border (to provide the Mexican government with input into dispersant use decisions that may affect their waters), and west from a line 15 nautical miles from the nearest point of land and extending out to the western most limits of the national Exclusive Economic Zone (Figure 1). Special cases were made for offshore islands which also had a 15 nautical mile dispersant use buffer zone. The separation of the QAZ from California waters was undertaken to accommodate the State until it could develop a dispersant decision process for California waters including the environmentally sensitive near shore areas as required by State statute.

The QAZ Plan was a streamlined dispersant use checklist process to provide the Federal On Scene Coordinator (FOSC), who is the federal representative in the Unified Command (UC), with a mechanism to secure RRT permission or denial for dispersant use within one to two hours.

Until the present, the State had no uniform published approach or guide lines for dispersant use. In early 1995, the OSPR finalized a "draft" Dispersant Use Decision Process (DUDP) pursuant to State statutory requirements which addressed the use of dispersants in State waters (OSPR, 1995). The purposes of the1995 document were to provide: a written position and guidelines for dispersant use in state waters; a process for incorporating dispersant efficacy and biological resources data into the decision making process; and a speedy DUDP for examining dispersant.

While the QAZ process was designed to provide a quick dispersant response in waters away from environmentally sensitive areas, the State's DUDP was designed to protect the most environmentally sensitive areas, when possible, through selected dispersant use. In general, the State has identified environmentally sensitive areas as the near shore surface waters, including those surrounding the offshore islands of the state, where endangered marine mammals and thousands to hundreds of thousands of sea birds may exist at any one time and the highly productive tidal inlets and intertidal regions of the mainland and offshore islands.

The State's premise on dispersant use is that in general, petroleum on the surface of the ocean poses more of an immediate and long term risk to living marine resources and habitats than petroleum dispersed into the water column. There are exceptions to this approach and they are identified in the Quick Approval Process (QAP) boundary definition and discussed in the QAP Checklist backup material provided in Appendix I.

If a dispersant response is to be successful it must typically be undertaken within a small window of opportunity following the release of oil, which often can be measured in hours. In order to accomplish such a task, the UC must have a mechanism at their disposal to expedite the dispersant use decision. The QAP, a combination of the existing federal QAZ and the State's draft DUDP, is such a mechanism. This accelerated review process, conducted by the Planning Section of the UC, is designed to provide the UC with sufficient information to determine if a dispersant use request should be made, and to provide members of the RRT with sufficient information to approve or disapprove within the first two hours of its receipt. This information is provided through the use of an Incident Command (IC) decision making process and support documents. If the results of the decision making process supports dispersant use, the FOSC, representing the UC, will contact the RRT, provide information as required, and obtain a dispersant use decision.

The purpose of the QAP approach is to take advantage of the time-restricted dispersant-use window-of- opportunity. If the UC requests the use of dispersants, based on the QAP process, to address an oil spill and the RRT provides approval for dispersant use, there must be an understanding by both parties that: (1) the use of dispersants represents an acceptable risk to the environment; (2) the selected dispersant will have an acceptable level of effectiveness on the spilled oil; (3) dispersant application will not disperse all of the spilled oil; and (4) mechanical or other methods will be required to address the remaining oil.

The National Contingency Plan, Section 300.910 authorizes the OSC, with the concurrence of the EPA representative to the RRT and, as appropriate, the concurrence of the State representative to the RRT with jurisdiction over navigable waters threatened by the release of discharge (of oil) and in consultation with the DOC and DOI natural resource trustees, when practicable, to authorize the use of dispersants. The Commandant of the USCG has pre-designated the USCG Captains of the Port under his jurisdiction of On-Scene Coordinators for oil spills, and has delegate authority and responsibility for compliance with Section 311 of the Federal Water Pollution Control Act to them. The USEPA has been delegated authority under Subpart J of the NCP to authorize use of dispersants for control of oil spills.

California Government Code Section 8670.7(f) delineates the Administrator of the Office of Spill Prevention and Response, Department of Fish and Game as having the State authority over the use of all response methods, including, but not limited to dispersants. The Governor of the State of California has delegated state representation on the RRT to the Administrator of the OSPR.
It will be the responsibility of the RRT Alternative Response Team (ART) to annually review the QAP Plan and report its findings to the RRT at a scheduled meeting. The group will be responsible for the administrative upkeep of the contact list as well as insuring that the plan is updated to reflect any changes in regional polices (including those of Region X, the state of Oregon and Mexico), and technological advances.

The geographic boundaries of the QAP are those marine waters off the coast of California which occur between lines drawn perpendicular to the Oregon/California border and to a point 15 nautical miles from the California/Mexican border. A fifteen nautical mile exclusion zone is provide from the Mexican border to ensure the sovereignty of the waters of Mexico. Dispersant use in these waters will require coordination with the Joint Response Team. Offshore, the QAP extends seaward to the western most limits of the Exclusive Economic Zone. Inshore, the QAP is limited to those waters beyond a depth of 60ft, and a distance of .5 miles from the mainland and island shorelines or kelp beds . In addition, dispersant use is excluded from a one mile radius around the mouths of rivers having significant salmon and steelhead trout runs during peak periods of adult and smolt migration.

Marine Sanctuaries comprise a significant fraction of the coastal waters off California. The use of dispersants in the Sanctuaries will require considerable coordination with the Sanctuary Managers and their staff. Though Sanctuaries are represented by the Department of Commerce delegate on the RRT, the Sanctuary Manager and/or staff members will be requested to take part in the QAP process through their participation in the UC Planning Unit's ART section. The Sanctuaries can provide resource data and insight necessary to the QAP process that may otherwise not be available to the UC in a timely manner, thus their participation can be crucial.

Monitoring of dispersant effectiveness is desirable and should be conducted, if practical, during any dispersant application. That said, predicating the use of dispersants on the presence of in-place monitoring equipment is not appropriate. Dispersant application should not be delayed should sea conditions, equipment failure, or other unavoidable circumstances preclude the positioning of monitoring equipment and personnel. If the UC requests the use of dispersants and the RRT approves their use there must be an understanding by all parties that the use of dispersants represent an acceptable risk to the environment and the dispersant will have a acceptable level of effectiveness on the spilled oil.

Until recently, there has not been a standardized approach to monitor the effectiveness of dispersant application at sea. A working group of federal scientist and oil spill responders has recently developed the Special Monitoring of Applied Response Technologies (SMART) program to monitor the effectiveness of alternative response technologies including dispersants. The dispersant SMART program provides a process to rapidly gather information on the effectiveness of dispersant application and provide the information to the UC in a timely manor. The SMART program consists of both visual observations (Tier 1) and on-site water column monitoring (Tier 2). In addition, the program can be expanded to examine the fate and transport of the dispersed oil (Tier 3). Once this program is finalized, it will provide a practical and cost effective approach to effectiveness monitoring and should be incorporated into QAP program.

See section 4007.05 of the Region 9 Contingency Plan for additional information.

3270 In-Situ Burn

At the time of an oil spill incident, the FOSC is authorized to evaluate the use of in-situ burning. This detailed evaluation is usually accomplished in the Planning Section. The use of in-situ burning should be considered when this technique will lessen the overall environmental impact of the spill and is permitted under specified circumstances. Detailed information regarding evaluation of in-situ burning as well as all applicable policies and procedures can be found in Appendix XIII of the Region IX Regional Contingency Plan. Approval of in-situ burning within a designated pre-approval zone may be accomplished by the FOSC and without further concurrence or consultation with the RRT as outlined in the Region IX Regional Contingency Plan, Appendix XIII Subpart A. All other use of in-situ burning requires the approval of the RRT as outlined in the Region IX Regional Contingency Plan, Appendix XIII Subpart B.

See section 4007.06 of the Region 9 Contingency Plan for additional information.

3280 Bioremediation

Bioremediation is a treatment technology that enhances existing biological processes to accelerate the decomposition of petroleum hydrocarbons and some hazardous wastes. Bioremediation has been used extensively in waste water treatment of spilled oil. The most extensive field research efforts have been the shoreline treatment studies in Alaska following the Valdez incident. This research suggested that shoreline treatment by nutrient enhancement significantly increased degradation rates of oil when compared to untreated shoreline areas. The benefits of bioremediation, however, have not been adequately demonstrated through field applications. Consequently, this technology should be considered more experimental than an accepted standard for clean up of oil spills.

The promise of bioremediation providing increased rates of oil degradation with minimal input of human effort to cleanup the spilled oil is attractive. However, the technology is time consuming, unproved in open water environments, and probably best suited to the treatment of specific types of shorelines and marsh habitats. At present, bioremediation should be viewed as a polishing agent for the final stages of cleanup rather than as a primary response tool -especially considering the slow rates of reaction to degrade the oil.

3280.1 RRT-IX Approach Bioremediation Use on Oil Spills

The primary objective of oil spill abatement and cleanup is to reduce the effect of spilled oil on the environment. Physical removal is the preferred method. However, mechanical recovery may be limited by equipment capability, weather and sea conditions spill magnitude, safety considerations, site accessibility and surface load restrictions. In addition, efforts and equipment used for mechanical recovery may prove to be more destructive to the environment than the original contamination with oil.

Based on the results of current research, and a general understanding of the principles of bioremediation, it is RRT-IX policy that this technology should be <u>used strictly as a shoreline remediation tool with a preference for nutrient</u>

enhancement without the introduction of indigenous and/or non-indigenous microbes.

3280.2 RRT-IX Policy Guidelines for Bioremediation Use

The FOSC can request the use of a bioremediation agent through the processes outlined in the Bioremediation Checklist (Figure 4000.E in Appendix XIV. Each agency resource trustee representative will be the point of contact for their constituency; the SSC will be the point of contact for all not represented.

Section 300.910 of NCP authorizes the use of biological additives for the dispersion/abatement of oil spills. The product must be listed on the NCP Product Schedule and on the l ist of products licensed by the SWRCB for use in the State of California to be considered for use along the California coastline. The following guidelines consolidate existing Federal and State regulations and streamline the approval process.

(A) Decision Process
The OSC shall adhere to the following:

(1) Inland and shoreline areas: The OSC will obtain approval from the EPA and the California Department of Fish and Game (CDF&G) representing the State of California. The EPA and State representative to the RRT shall consult with the DOI and DOC natural resource trustee(s).

Note: In California, bioremediation products considered for use must be on California's list of approved products, or be incident specific approved by the State representative to the RRT.

(2) Documentation/Technical Assistance: EPA, affected states(s), DOI, and DOC will each have a representative available to coordinate data collection and interpretation and to consult with the OSC.

(3) Monitoring: The application process and results must be recorded visually. This can be accomplished using film or video footage made from the shore or from the air. Visual observations can also be made by a trained observer. Filming should be done without causing delay to the bioremediation application activity.

(4) Documentation

3300 Emergency Response

Refer to Section 3003.01 of the Region 9 Contingency Plan

3310 SAR

Refer to Section 3003.01.1 of the Region 9 Contingency Plan

3320 Salvage/Source Control

Refer to Sector San Francisco Salvage Plan and Section 3003.01.2 of the Region 9 RCP

Vessel Salvage and Marine Firefighting are often related events. While either can be low profile, when an ICS is established to deal with these types of events, there is often high visibility and public interest with the Captain of the Port (COTP) being the center of focus for decisions made. When the event involves a Potential Place of Refuge issue, the COTP is clearly responsible under NRT and RRT guidance as well as USCG procedures (COMDTINST 16451.9). Additionally, if the vessel of concern is by-pass traffic, there may be U.S. Customs and U.S. Department of State issues in addition to the traditional concerns of public safety, technical feasibility, conveyance and waterway management.

3321 Salvage Operations and Requirements

The Salvage Branch Chief will report to the OSC and will be responsible for implementing the assigned salvage portion of the IAP. Given the technical expertise associated with salvage operations, there are no requirements that the Salvage Branch Director be a specified state or federal representative. There are also significant Public Information issues which may require skillful management by the UC. The Salvage Branch Director should be cognizant of those concerns and be ready to provide updates to the OSC regularly. The Ops and Planning Chiefs should be available for stakeholder organization and media/public interviews and addresses.

3321.1 Regulatory Requirements and Procedures

Procedures and regulatory requirements are provided in Section 3003.01.2 of the Region 9 Contingency Plan as follows:

3003.01.2(a) Notification Of Marine Casualties

3003.01.2(a1) Requirements of 46 CFR 4

Regulations contained in 46 Part 4 of the Code of Federal Regulations require owners, agents, masters, operators, or persons in charge, immediately after addressing resultant safety concerns, to notify the nearest Marine Safety Office, Marine Inspections Office, or Coast Guard Group Office whenever a vessel is involved in a marine casualty. These casualties include:

1. An unintended grounding or an unintended strike of, or allision, with a bridge;
2. An intended grounding, or an intended strike of a bridge, that creates a hazard to navigation, the environment, or the safety of a vessel;
3. Loss of main propulsion, primary steering, or any associated component or control system that reduces the maneuverability of the vessel;
4. An occurrence that adversely affects the vessel's seaworthiness or fitness for service or route, including fire, flooding, or failure of or damage to fixed fire extinguishing systems, life saving equipment, auxiliary power generating equipment, or bilge pumping systems;
5. Loss of life;
6. An injury that requires professional medical treatment;
7. Any occurrence resulting in more than $25,000 of property damage, not including salvage cost.

3003.01.2(a2) Requirements of 33 CFR 160

33 Part 160.215 requires vessels carrying hazardous materials to notify the nearest Coast Guard Marine Safety Office whenever a hazardous condition exists, either aboard a vessel or caused by a vessel or its operation.

3321.2 Responsibilities of the Responsible Party and FOSC are also provided in the RCP in Section 3003.01.2(b-f) as follows:

3003.01.2(b) Responsibilities Of The Responsible Party and FOSC

In the case of an incident, the Responsible Party (RP) must take adequate measures to mitigate and/or remove damage, or risk of damage, caused by the vessel or the release of any materials from the vessel. The RP will pay for all legitimate response measures, up to their limit of liability. If an RP cannot be identified, or the acting RP fails to adequately respond, it is the responsibility of the Captain of the Port or FOSC to take over control of a particular aspect of, or the entire response. In this case, funding will be provided by the federal government until an RP is identified and charged for the response.

3003.01.2(c) Types of Marine Casualties

The primary objective in any salvage scenario, whether a single event casualty or combination of casualties, is to minimize the risk to human health, the environment, and property. The following six types of casualties are listed in order of frequency

3003.01.2(c1) Hull or Machinery Damage

A vessel's hull or machinery may be damaged by shifting cargo, storm damage, or other causes, and may render a vessel unable to maneuver. The greatest threats to the vessel, cargo, and environment exist when loss of maneuverability happens close to shore or hazards to navigation. Use of anchors or towing vessels may be the best defense in slowing the unintended movement of a vessel drifting towards a hazard.

3003.01.2(c2) Stranding or Grounding

Unintentional groundings may result from navigational error, anchor drag, loss of maneuverability, or for other reasons. Ground reaction, which is usually measured in long tons or metric tons, is the weight of the vessel that is being supported by the ocean bottom instead of the water. Ground reaction can cause a vessel to capsize, become holed, break apart, or become difficult to remove from ground. A salvor or naval architect can make a good estimate of ground reaction using the information gathered by the crew or response personnel including pre-casualty drafts, post-casualty drafts, tide cycle, location/depth of ground (usually determined with soundings), and the type of bottom. Once ground reaction is determined, it is fairly simple to estimate the force-to-free, which is the measure of the force needed to pull the vessel off the ground. Force-to-free is usually listed in short tons, which is equivalent to tug bollard pull. In order to float a vessel free or pull it off with tugs/ground tackle, ground reaction must usually be reduced in a controlled manner by deballasting, lightering, and/or tidal lifting.

3003.01.2(c3) Collision

The most common result of a collision at sea is hull damage and flooding. Collisions are sometimes accompanied by fire and explosions, as many ship's systems and/or cargo may be damaged upon impact. The general priorities after a collision usually include damage assessment, flooding control, and firefighting. Typically, a vessel is not well-equipped to handle rapid flooding, and, when left unchecked, can lead to capsizing and foundering. Often vessel crews are not well-versed in damage control, requiring a prompt response to ensure professional salvers and marine inspectors are on scene as soon as possible.

3003.01.2(c4) Fire and Explosion

Fires of any size onboard a vessel should be treated with extreme caution as they may quickly turn into a conflagration. Most commercial vessels will be equipped with fixed fire fighting systems to contain fires started in the engine room (the most common source of shipboard fires). Large commercial vessel crews are generally trained to combat fires that originate in the engine room or accommodation spaces. Crews are generally not trained to fight fires originating in or spreading to the cargo. Most professional salvers offer shipboard firefighting capability - either with in-house resources or via subcontractor capabilities. Shore based fire fighters often do not have an appreciation for the special considerations for shipboard firefighting, especially fixed fire fighting systems or vessel stability, and therefore should be monitored closely when employed to extinguish a fire in port.

3003.01.2(c5) Allision

Allisions occur when a vessel strikes a fixed object. Most of the considerations are the same as a collision, with the addition of assessing the damage sustained by the object, especially if the object was a bridge or critical piece of infrastructure. Immediate notification should be made to the Army Corp of Engineers and Federal and State Departments of Transportation. Appropriate actions should be taken to ensure the object does not pose a risk to future transportation onshore or to other vessels.

3003.01.2(c6) Stress Fractures

Stress fractures are failures in the construction of the vessel and may be due to stresses imposed on a vessel because of a heavy seaway, improper loading or ballasting, or construction material fatigue. Cracks can lead to pollution or flooding incidents and, under extreme circumstances, total ship loss. Therefore, it is important to quickly assess the size, location, and orientation of the crack. Surveyors, shipyards, and Coast Guard Marine Inspectors are familiar with methods to arrest or repair cracks.

3003.01.2(d) Initial Response And Casualty Assessment

Common to all casualties is a need for the quick and substantial allotment of response resources. The Unified Command will set the objectives of a vessel casualty response. Early dissemination of an accurate assessment of the vessel's condition and deployment of appropriate response resources is essential.

3003.01.2(d1) Initial Actions to be taken by the Crew 3003.01.2(d2) Critical Information

Initial actions to be taken by vessel's crew

Have ship's personnel report to emergency stations
Secure watertight fittings
Take appropriate fire fighting actions
Notify the ship's operations controller
Obtain an accurate cargo storage plan
Request shore personnel request salvage assistance
Display day shapes & sound appropriate signals

There is certain information that is critical to planning a successful salvage operation. This information, essential to the response planning process, should be gathered from the vessel master or on-scene response personnel, as appropriate to the situation. The information gathered should be used to determine the "window of opportunity" - i.e., when the most factors align for a successful operation.

3003.01.2(d3) **Identify Response and Salvage Assets**

The RP should immediately contract and set into motion adequate response and salvage resources. Historically, there has been reluctance on behalf of the vessel's representatives to engage a professional salvor. A decision to attempt operations without a professional salvor should be examined critically by the FOSC. To assist the RP in contracting a professional salvor, the FOSC may share information of proven response and salvage resources as listed in Appendix 4. In addition to ensuring that the RP has contracted adequate response resources, the FOSC should identify and deploy appropriate Coast Guard resources to respond to the incident. These response teams should include unit Pollution Investigators, Casualty Investigators, and Vessel Inspectors. Furthermore, the SERT team at the Marine Safety Center should be engaged and, potentially, the Navy SUPSALV.

3003.01.2(e) Setting the First Operational Period Objectives

Once enough information has been gathered to proceed with a decisive action plan, the USCG Operational Commander, IC or UC will set forth operational period objectives and functional tasks. These objectives and tasks *may* include but are not limited to:

1. Locate and evacuate all passengers and crew
2. Control vessel movement
3. Get response personnel and equipment on-scene
4. Extinguish shipboard fire
5. Stop/slow flooding
6. Stop/slow vessel movement toward potential hazards
7. Contain pollution
8. Identify suitable port of refuge
9. Create a salvage plan
10. Mitigate potential impacts of the casualty on other vessel traffic and port activities
11. Evaluate risk to public- i.e., hazardous material release, air quality, etc.
12. Prepare and approve press release
13. Establish a safety zone
14. Contact all appropriate Federal, State and local agencies, as well as foreign governments
15. Evaluate/mitigate the environmental impacts of incident
16. Identify an appropriate lightering vessel

Example salvage and pollution objectives:

1. Conduct damage/stability assessment; develop and implement salvage plan.
2. Commence fire fighting and contain, extinguish and overhaul the fire.
3. Develop/implement vessel transit plan to include final safe destination/berth for impacted vessel.
4. Initiate actions to control he source of the spill and minimize the volume released.
5. Conduct efforts to effectively clean up, recover and dispose of spilled product along open water and shoreline areas.
6. Identify threatened and impacted wildlife and prepare to recover, rehabilitate and release injured wildlife.

3003.01.2(f) Oil/Hazardous Material Release Mitigation And Lightering

Oil spills or hazardous material releases are of the greatest potential during vessel groundings and almost a certainty during a major collision or other event when there is a breach in the hull. There are several ways to verify an oil spill or hazardous material release. The primary method may be observation of a sheen emanating from the damaged vessel. However, this method may be of limited usefulness at night and is not indicative of damages inboard of the hull structure. A secondary method is to sound the tanks and monitor liquid levels for any fluctuations that would indicate a breach. Bunker and cargo tanks should be immediately sounded and monitored closely for changes that would indicate a breach. Given the high correlation between major marine casualties and pollution incidents, it is prudent to provide, at a minimum, a containment boom to surround the vessel(s).

3003.01.2(f1) Lightering

One of the most effective ways to mitigate or prevent an oil spill or hazardous material release is to remove all remaining cargo and unnecessary bunker fuel from the vessel. This is particularly useful when the risk of a hull breach is increasing due to changing environmental or physical conditions on the vessel. Vessels may be lightered to another vessel, or lightered to mobile facilities ashore. Choosing which is most appropriate will depend on the location of the vessel and availability of lightering platforms and equipment. Whichever is chosen it is important to ensure the receiving vessel or facility is qualified to handle the lightered material and that any cargo/residue in hoses and holding tanks are compatible with lightered material. Furthermore, the effects on the stability of the vessel should be taken into account when lightering a vessel, which should be addressed in the lightering and salvage plan. While lightering may present benefits when attempting to re-float a vessel it may also present additional structural stresses upon the vessel. It is important to work with naval architects as well as the person in charge of loading/offloading the vessel, who is frequently the Chief Officer or First Mate of the vessel.

3321.3 Salvage Team Tasks

Salvage teams will assess the damage and stability of involved vessels, identify needed repairs, conduct a risk/gain analysis, identify needed equipment, estimate transit times, and determine the need for safe havens. When these details become available, the Salvage Branch Chief will communicate the information to the COTP and seek direction and approval as appropriate. Given the technical expertise associated with salvage operations, there is no requirement that the Salvage Branch Chief be a specified state or federal representative.

3321.3.1 Potential Place of Safe Refuge Assessment

As soon as it is apparent that the situation constitutes a Potential Place of Safe Refuge issue, the Salvage Branch Chief shall seek the concurrence of the COTP. With the concurrence of the COTP, the Salvage Branch Chief will advise the Operations and Planning Section Chiefs. The PSC will set up a PPOR unit. The Salvage Team will identify the constraints which will determine the scope of PPOR needs and alternatives and may include:

Safety of Crew
Safety of Responders / Salvors
Stability of vessel
Availability of Salvage equipment
Weather concerns
Cargo and fuel lightering
Customs and U.S. State Department issues
Depths, length and other limitations of vessels or ports

These limitations will be used to identify a list of possible PPOR's. This list will be provided to the PPOR Unit. The respective salvage team will supply participants to the PPOR Unit to capture ship and salvage information and participate in communications with other stakeholders involved. For additional PPOR Unit details refer to section 4770.

3321.3.2 Salvage Plan Preparation

The Salvage Team(s) will develop a salvage plan(s). The following excerpt is from Section 3003.01.2(g) of the RCP:

> **3001.2(g) Vessel/Cargo Salvage Plan Review**
> A plan is essential to ensure a safe and successful salvage operation. Depending on the urgency and complexity of the operation, the quality of the plan may vary from a bound document approved by naval engineers to a rough outline of operations. All involved parties must ensure that the plan provided is feasible and appropriate given the constraints of the operation. Given optimal conditions as well as time and resources available, a *complete* salvage plan will include the elements listed in Appendix 3. When evaluating a salvage plan it is essential to rely upon the resources available to an IC or UC for these particular incidents.

3330 Marine Fire Fighting

Refer to Sector San Francisco Marine Firefighting Contingency Plan

3340 Hazmat

Refer to Section 3003.01.4 of the Region 9 Contingency Plan

3350 EMS

Refer to Section 3003.01.5 of the Region 9 Contingency Plan

3360 Law Enforcement

Refer to Section 3003.01.6 of the Region 9 Contingency Plan

3400 Air Operations

Refer to the Incident Management Hand Book (IMH)

3410 Air Tactical

Refer to the Incident Management Hand Book (IMH)

3420 Air Support

Refer to the Incident Management Hand Book (IMH)

3500 Staging Areas

3510 Pre-Identified Staging Areas

Refer to Incident Management Hand Book (IMH) at Chapter 9, page 11.

3520 Security

Refer to Incident Management Hand Book (IMH).

3600 Wildlife

Refer to Section 3007 and the Ca Wildlife Response Plan, Appendix XXIIa of the Region 9 Contingency Plan.

3610 Fish and Wildlife Protection Options

Refer to Sections 3007.01 of the Region 9 Contingency Plan.

3620 Recovery

Refer to Appendix XXIIa of the Region 9 Contingency Plan.

3630 Wildlife Rehab

Refer to Section Appendix XXII of the Region 9 Contingency Plan.

3640 Essential Fish Habitat

Refer to Volume 2 Section 9802.2 of this Area Contingency Plan.

3700 Reserved

3800 Reserved

3900 Reserved for Area/District